Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
	)	
Wireless Operations in the 3650-3700 MHz Band	)	ET Docket No. 04-151
	)	
Rules for Wireless Broadband Services in the 3650-3700 MHz Band	)	WT Docket No. 05-96
	)	
Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3GHz Band	)	ET Docket No. 02-380
	)	
Amendment of the Commission's Rules With Regard to the 3650-3700 MHz Government Transfer Band	)	ET Docket No. 98-237
	)	

OPPOSITION TO PETITIONS FOR RECONSIDERATION AND COMMENTS OF THE SATELLITE INDUSTRY ASSOCIATION

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SUMMARY

In promulgating its *Order* in this proceeding, the Commission set out to provide access to the 3650-3700 MHz band for rural WISPs and to foster efficient spectrum use. As the various petitions filed in this docket demonstrate, however, the rules adopted in the *Order* do not effectively further those goals and leave open several crucial interference issues that not only threaten the possibility of disruptive interference into co-frequency extended C-band Fixed-Satellite Service ("FSS") receive operations and adjacent conventional C-band FSS receive operations, but also fail to provide the necessary regulatory certainty for WISPs and other terrestrial wireless service providers in the 3650-3700 MHz band.

The record clearly establishes that the "quasi-licensing" regime for WISPs adopted in the *Order* not only increases the potential for harmful interference into FSS earth station receive operations, but does so with no corresponding benefits for the very service providers that the Commission seeks to empower because the scheme will actually *discourage* investment in the band by potential service providers. In addition, as SIA explained in detail in its Petition for Partial Reconsideration, the *Order* does not adequately protect conventional C-band FSS earth station receivers from destructive out-of-band emissions originating in the 3650-3700 MHz band, and fails to address the problem of low-noise block-downconverter saturation that will likely be caused by new operations in the 3650-3700 MHz band.

Finally, some petitioners have asked the Commission to take the inadvisable step of increasing the power limits for WISP mobile stations and/or base stations, or of weakening the protection afforded to grandfathered extended C-band FSS earth stations.

Both of these suggestions are contrary to the public interest as they invite potentially harmful and unpredictable interference into FSS earth station receivers with little or no offsetting public interest benefit.

Accordingly, in the context of reconsidering the *Order*, the Commission should adopt an exclusive licensing regime in the 3650-3700 MHz band, and deny any request to increase the power level for WISP operations or to relax the FSS earth station protection requirements. In addition, as request by SIA, the Commission should adopt an OOB emission limit no greater than that it proposed for unlicensed devices in the Notice of Proposed Rulemaking in this proceeding and address the problem of WISP operations saturating the LNBs of earth stations operating in the 3700-4200 MHz band.

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OPPOSITION TO
PETITIONS FOR RECONSIDERATION
AND COMMENTS OF
THE SATELLITE INDUSTRY ASSOCIATION

The Satellite Industry Association ("SIA"), pursuant to Section 1.429 of the Commission's rules, 47 C.F.R. § 1.429, hereby respectfully submits this Opposition to Petitions for Reconsideration and Comments in the above-captioned proceeding.[1] SIA is a U.S.-based trade association providing worldwide representation of the leading satellite operators, service providers, manufacturers, launch services providers, remote sensing operators and ground equipment suppliers.[2] SIA and its member companies are

[1] *In the Matter of Wireless Operations in the 3650-3700 MHz Band, Rules for Wireless Broadband Services in the 3650-3700 MHz Band, Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3GHz Band, Amendment of the Commission's Rules With Regard to the 3650-3700 MHz Government Transfer Band, Report and Order and Memorandum Opinion and Order*, 20 FCC Rcd 6502 (2005) ("*Order*").

[2] SIA is the unified voice of the U.S. satellite industry on policy, regulatory, and legislative issues affecting the satellite business. SIA includes Executive Members The

extremely concerned about wireless Internet service provider ("WISP") and other newly authorized operations in the 3650-3700 MHz band that are not adequately designed to protect Fixed-Satellite Service ("FSS") earth station receive operations in that band and in the adjacent 3700-4200 MHz band.[3]

I. INTRODUCTION

In promulgating its *Order* in this proceeding, the Commission set out to provide access to the 3650-3700 MHz band for rural WISPs and to foster efficient spectrum use. As the various petitions filed in this docket demonstrate, however, the rules adopted in the *Order* do not effectively further those goals and leave open several crucial interference issues that not only threaten the possibility of disruptive interference with extended C-band FSS receive operations in the 3650-3700 MHz band and conventional C-band FSS receive operations in the adjacent 3700-4200 MHz band, but also fail to provide the necessary regulatory certainty for WISPs and other terrestrial wireless service providers in the 3650-3700 MHz band.

Boeing Company; Globalstar LLC; Hughes Network Systems, Inc.; ICO Global Communications; Intelsat; Iridium Satellite LLC; Lockheed Martin Corp.; Loral Space & Communications Ltd.; Mobile Satellite Ventures LP; Northrop Grumman Corporation; PanAmSat Corporation; SES Americom, Inc., and TerreStar Networks Inc.; and Associate Members Eutelsat Inc., Inmarsat Ltd., IOT Systems; Marshall Communications Corp.; New Skies Satellites Inc., Spacecom Corp.; Stratos Global Corp.; The DirecTV Group; and XM Satellite Radio.

[3] SIA recognizes that the *Order* authorizes operations other than WISP services in the 3650-3700 MHz band. However, for ease of reference, the discussion of WISP operations herein applies to WISP and all other operations authorized by the *Order*.

As SIA explained in detail in its Petition For Partial Reconsideration,[4] the *Order* as written does not adequately protect C-band FSS receive operations from destructive out-of-band ("OOB") emissions originating in the 3650-3700 MHz band, and fails to address the problem of low-noise block-downconverter ("LNB") saturation that will likely be caused by new operations in the 3650-3700 MHz band. In addition, SIA agrees with many of the issues raised in the various other petitions for reconsideration. Notably, many petitioners have identified problems that share a common solution with those identified by SIA—imposition of a full licensing regime for new operations in the 3650-3700 MHz band.

Other petitioners, however, ask the Commission to abdicate its statutory duties under the Communications Act and introduce a wild-west frontier of high-powered operations using unproven sharing schemes in spectrum in and immediately adjacent to frequencies used by FSS earth station receive operations – some of the most sensitive and most critical communications facilities in the nation. These proposals, if adopted, would almost certainly result in substantial interference into conventional and extended C-band FSS receive operations.

II. IT IS ESSENTIAL TO PROTECT FSS EARTH STATIONS FROM IN-BAND AND OUT-OF-BAND INTERFERENCE

As the Commission is aware, satellites and their associated earth stations constitute an essential element of the nation's Critical Information Infrastructure ("CII"), providing a broad array of important communications services to consumer, business, and

[4] Petition For Partial Reconsideration of the Satellite Industry Association, ET Docket No. 04-151, WT Docket No. 05-96, ET Docket No. 02-380, ET Docket No. 98-237 (filed June 10, 2005) ("SIA Petition").

government users alike. For example, satellite services offer unique capabilities that meet the demand of the public safety community for ubiquitous and interoperable broadband and narrowband communications networks. In fact, satellite services are being used today to meet the needs of emergency responders and have been recognized as critical national infrastructure by several government officials as well as the NSTAC Satellite Task Force Report.[5] It was for reasons such as these that Congress designated satellite networks as among "the key resources and critical infrastructure of the United States, including…information technology and telecommunications systems (including satellites)…and the physical and technological assets that support them."[6]

The 3700-4200 MHz band is the principal downlink allocation for C-band satellites, and the adjacent 3650-3700 MHz band is used primarily for international services. This spectrum is intensively used by satellite networks for a number of important satellite-delivered communications services throughout the United States, and FSS earth stations operating in these bands are sensitive to interference from both in-band and OOB sources. As discussed in the SIA Petition, harmful interference in the 3700-4200 MHz band from OOB emissions from wireless operations in the 3650-3700 MHz band would be devastating to the satellite industry and the broad array of customers it serves. Similarly, co-frequency extended C-band FSS earth station operations require the interference protection afforded by the power limits, specific operating conditions (*e.g.*, mobile unit transmissions permitted only when within range of a base station), and protection requirements within 150 km of grandfathered earth station sites set forth in the

[5] A Fact Sheet summarizing the NSTAC Satellite Task Force Report to the President is available at http://www.ncs.gov/nstac/nstac_publications.html.

[6] Section 201(d)(5) of the Homeland Security Act of 2002, Pub. L. No. 107-296, 116 Stat. 2157 (2002) (parenthetical in original).

Order. The public interest requires the Commission to ensure unfettered continuity of extended and conventional C-band satellite services.

Accordingly, the Commission should ensure that any action on reconsideration ensures full protection for in-band and adjacent-band FSS receive operations. In particular, as suggested by SIA, the Commission should adopt an OOB emission limit no greater than that it proposed for unlicensed devices in the Notice of Proposed Rulemaking in this proceeding, and address the problem of WISP operations saturating the LNBs of earth stations operating in the 3700-4200 MHz band. In addition, as discussed herein, the Commission should maintain the maximum power levels established in the *Order*, retain the 150 km "protection zones" established around grandfathered earth station sites, and permit interested parties to develop appropriate procedures and criteria to coordinate WISP operations within such protection zones.

III. THE COMMISSION SHOULD ADOPT AN EXCLUSIVE LICENSING REGIME IN THE 3650-3700 MHZ BAND

In its Petition for Reconsideration, SIA noted that, although the *Order* does not permit full unlicensed operations in the 3650-3700 MHz band, it adopts a "quasi-licensed" approach that affords WISPs both primary regulatory status and virtually all of the benefits associated with unlicensed services.[7] For example, the Commission's licensing approach requires registration of fixed WISP transmitters and base stations and limits the use of mobile equipment to areas within range of a base station, but otherwise imposes only minimal restrictions on WISP deployment.[8] SIA pointed out that a perfunctory registration requirement for some devices does not alter the fact that "quasi-

[7] *Order* at ¶¶ 25-29.

[8] *Order* at ¶¶ 59-66.

licensed" WISP operations, including wholly unregistered mobile transmitters, have more in common with unlicensed devices described in Part 15 than they do with formally licensed services.[9]

The record now clearly establishes that the "quasi-licensing" regime for WISPs adopted in the *Order* not only increases the potential for harmful interference into FSS earth station receive operations, but does so with no corresponding benefits for the very service providers that the *Order* seeks to empower. In fact, the petitions filed in this docket overwhelmingly demonstrate that the *Order's* "quasi-licensing" scheme will actually *discourage* investment in the band by potential service providers. Thus, the Commission should adopt "exclusive use" licensing for WISP operations because such an approach will facilitate prompt introduction of services in the band, promote efficient use of the spectrum, and create a more predictable sharing environment for all users of the 3650-3700 MHz band.

A. Most Parties Agree on the Need for Exclusive Licensing of Some Sort

In its Petition for Reconsideration, Motorola makes the simple and persuasive point that "[t]o enable the rapid and successful deployment of broadband wireless services, the Commission should issue exclusive licenses."[10] Motorola comes to this conclusion based on the problematic nature of the Commission's contention-based protocol, its inappropriateness for large-scale operations, and the resultant high

[9] For example, Part 24 imposes rigorous power and emissions limits. *See, e.g.*, 47 C.F.R. §§ 24.132, 24.133, 24.237, 24.238.

[10] Petition For Reconsideration of Motorola, Inc., ET Docket No. 04-151, WT Docket No. 05-96, ET Docket No. 02-380, ET Docket No. 98-237 (filed June 10, 2005) ("Motorola Petition").

administrative hurdles facing users.[11] The problems presented by the *Order's* quasi-licensing approach are novel and would require time for the industry to address and overcome; as a result, Motorola urges the Commission to implement a more traditional exclusive licensing regime in order to ensure "the most efficient and rapid deployment of wireless broadband services across the U.S." in the 3650-3700 MHz band.[12]

The majority of petitioners agree with Motorola on the need for exclusive licensing of some sort.[13] As Intel *et al.* succinctly state, "[c]ompanies are more willing to risk capital investments where they can better control spectrum access and thus create optimum QoS for their subscribers."[14] On this record, it is clear that the business-driven investment in new services that the Commission wished to encourage by lightly regulating the 3650-3700 MHz band, particularly in rural and underserved areas, will in

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[11] *Id*. at 4-5.

[12] *Id*. at 5-6.

[13] *See* Petition For Reconsideration of the Enterprise Wireless Alliance, ET Docket No. 04-151, WT Docket No. 05-96, ET Docket No. 02-380, ET Docket No. 98-237, at 5-8 (filed June 10, 2005) ("EWA Petition") ("it is unlikely that EWA members or other prospective users will invest in the Band without a reasonable level of confidence that their systems will not experience destructive interference"); Petition For Reconsideration of the Wireless Communications Association International, Inc., ET Docket No. 04-151, WT Docket No. 05-96, ET Docket No. 02-380, ET Docket No. 98-237, at 12-14 (filed June 10, 2005) ("WCAI Petition") (proposing exclusive licensing regime for at least half of the band and noting that "the non-exclusive licensing regime adopted in the *Report and Order* does not assure that licensees can provide the QoS that the marketplace is increasingly demanding of broadband service providers."); Petition For Reconsideration of WiMAX Forum, ET Docket No. 04-151, ET Docket No. 02-380, ET Docket No. 98-237, at 8-9 (filed June 10, 2005) ("WiMAX Forum Petition") (recognizing need for exclusive licensing in "more congested areas"); Petition For Reconsideration of Intel Corporation, Redline Communications, Inc., and Alvarion, Inc., ET Docket No. 04-151, WT Docket No. 05-96, ET Docket No. 02-380, ET Docket No. 98-237, at 20-24 (filed June 10, 2005) ("Intel Petition") ("Petitioners believe that exclusive licensing in the Top 50 MSAs will promote optimal quality of service and strong business investment certainty in these markets; such results are not possible with self-coordinated contention protocols based on the mutual obligation to cooperate.") (citations omitted).

[14] Intel Petition at 21.

fact be *discouraged* by an unreliable licensing regime that does not provide a uniform and predictable interference environment.

The widespread concerns regarding the quasi-licensing scheme adopted in the *Order* and the wild-west spectrum sharing environment that would result are in perfect harmony with SIA's concerns regarding protection of extended C-band FSS downlink operations in the 3650-3700 MHz band, as well as OOB emissions and LNB saturation in the adjacent conventional C-band. The record in this proceeding demonstrates that the stakes are high on all sides of the issue, and the Commission is well-positioned to address all parties' concerns by establishing an exclusive licensing regime for terrestrial wireless operations in the 3650-3700 MHz band.

B. The Commission Should Reject Proposals for Less Than Full Exclusive Nationwide Licensing

Some petitioners suggest that the Commission exclusively license only a portion of the 3650-3700 MHz band, or only some portion of the United States, while leaving some other portion under the quasi-licensing regime described in the *Order*. Such approaches offer only half a loaf, however, by correcting the problems associated with the quasi-licensing regime in only part of the spectrum or in only certain regions of the country.

The WiMAX Forum suggests that, although exclusive licensing is necessary in larger MSAs due to the congested environment, the *Order's* quasi-licensed regime is an appropriate option in rural areas because (i) barriers to entry for WISPs in rural areas should be minimized, and (ii) in any case, it is unlikely that more than two or three firms will endeavor to serve such low-density areas, so there is little concern over

interference.[15] However, the WiMAX Forum's second reason devours its first—if it is indeed unlikely that numerous firms will endeavor to provide WISP service in rural areas, then the benefits purportedly associated with a "weak" licensing regime are absent, and only the associated harms of such a regime for other users (including FSS receive earth stations) remain.

Similarly, the Wireless Communications Alliance International ("WCAI") suggests that the Commission license on an exclusive basis 25 MHz of spectrum in the 3650-3700 MHz band, and leave the remaining 25 MHz unlicensed so that it "can be readily accessed by those willing to accept the risks associated with non-exclusive operations."[16] The comments filed in this proceeding reveal, however, that potential service providers in the 3650-3700 MHz band are not "willing to accept the risks associated" with such activity. Without exclusive licensing there can be no control over operations in the band or regulatory certainty with respect to the interference environment, which undermines potential use of the band. Thus, the partial solutions proffered by the WiMAX Forum and WCAI simply leave a significant portion of the 3650-3700 MHz band, or a significant portion of the country, encumbered by the difficulties associated with the quasi-licensing approach adopted by the Commission.

If the Commission finds it necessary to leave some portion of the 3650-3700 MHz band under its quasi-licensed regime, SIA believes that the Commission should adopt the WiMAX Forum's geographic approach and adopt exclusive licensing in more densely populated areas. Dividing the 3650-3700 MHz band into exclusive and non-exclusive

[15] WiMAX Forum Petition at 8.

[16] WCAI Petition at 12-14 and Executive Summary.

blocks, as suggested by WCAI, would retain the problems identified by petitioners, and thus complicate the sharing environment, throughout the country.[17]

IV. THE COMMISSION SHOULD REJECT ANY REQUEST TO INCREASE MAXIMUM POWER LEVELS FOR OPERATIONS IN THE 3650-3700 MHZ BAND

In the *Order*, the Commission adopted for fixed stations the peak power limit, expressed as an e.i.r.p. density, of 25 Watts per 25 MHz, adopted for mobile stations the peak power limit of 1 Watt per 25 MHz, and limited the use of mobile units to areas within range of a fixed station. It also adopted, for protection of grandfathered FSS earth stations, an exclusion zone of 150 km. Despite the fact that the measures adopted in the *Order* will not protect grandfathered FSS earth stations in all cases (*see* Appendix A), SIA generally agrees that the Commission struck a reasonable balance between power levels and conditions for operation for mobile units in the new service, on one hand, and protection of FSS earth stations through establishment of protection zones, on the other. The requests of some petitioners to upset this balance should be rejected, particularly because this would require the Commission to re-open other related issues, such as the size of FSS earth station protection zones, with no countervailing benefit for the public.

[17] If the Commission adopts WCAI's proposal, however, it should exclusively license the upper portion of the 3650-3700 MHz band to reduce the potential impact of OOB emissions.

A. The Commission Should Reject Any Request To Increase Power Limits For Mobile Units or Base Stations

In their petitions for reconsideration, BRN Phoenix, Inc.,[18] WiMAX Forum,[19] and Intel *et al.*[20] argue in favor of increasing the e.i.r.p. limits established in the *Order* for equipment used to provide wireless services in the 3650-3700 MHz band. Any such increase would be a step in the wrong direction, and would endanger to an even greater extent the reliability of FSS downlink operations, particularly since there has been no mention by the Commission or any party of a coordination obligation for mobile users. Accordingly, the Commission should retain the power limits for fixed and mobile stations established in the *Order*.

The proposed increase in power levels for mobile units and/or base stations, with the resulting increase in range of mobile operations, would have two additive effects which will contribute to an increase in the potential for unacceptable interference with grandfathered earth station receive operations: (i) it would increase the power level of any interference directed at an earth station, and (ii) it would enable the operation of mobile units farther away from their base stations, and thus closer to earth stations, resulting in significantly reduced attenuation (path loss) of potential interference. Any attempt to increase power levels therefore must be linked to a concomitant necessary increase in the radius of grandfathered FSS earth station exclusion zones. SIA does not believe that the Commission needs to reopen the record on this issue. Thus, the

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[18] Petition For Partial Reconsideration of BRN Phoenix, Inc., ET Docket No. 04-151, WT Docket No. 05-96, ET Docket No. 02-380, ET Docket No. 98-237, at 2 (filed June 10, 2005) ("BRN Phoenix Petition").

[19] WiMAX Forum Petition at 11.

[20] Intel Petition at 20.

Commission should reject any request to increase the e.i.r.p. density of either mobile units or base stations in the 3650-3700 MHz band.

B. The Commission Should Reject Any Request To Increase Power Limits For Fixed Point-To-Point Links

In their petitions for reconsideration, WiMAX Forum[21] and Redline[22] argue in favor of providing separate, less restrictive maximum e.i.r.p. rules in the case of fixed Point-to-Point devices/links, similar to those contained in Part 15[23] relating to unlicensed operations in the 5725-5850 MHz band. The crucial difference between that band the 3650-3700 MHz band, however, is the operation of a significant number of FSS receive earth stations in the latter band.

The 150 km exclusion zone adopted for protection of FSS earth stations from interference caused by point-to-point links and base stations was derived based on the e.i.r.p. limits adopted in the *Order*. The protection afforded by this radius may no longer be meaningful in the case of point-to-point links with higher e.i.r.p. levels. However, if the Commission chooses to consider the possibility of increasing e.i.r.p. limits for fixed point-to-point devices/links, SIA urges it to do so only in association with establishing a larger protection zone that reflects the higher power levels and adopting regular licensing and coordination procedures for fixed stations in the 3650-3700 MHz band.

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[21] WiMAX Forum Petition at 11.

[22] Petition For Reconsideration of Redline, Inc., ET Docket No. 04-151, ET Docket No. 02-380, ET Docket No. 98-237, at Section E (filed June 10, 2005) ("Redline Petition").

[23] 47 U.S.C. § 15.247(b)(4)(ii).

V. THE COMMISSION SHOULD DENY ANY REQUEST TO RECONSIDER THE ORDER'S PROTECTION ZONE COORDINATION REGIME

In their petitions for reconsideration, WiMAX Forum[24] and the Wireless Communications Association International, Inc.[25] ask the Commission to reconsider its decision to require users within 150 km surrounding a grandfathered FSS earth station to coordinate their uses with the earth station operator. Instead, they ask the Commission to import wholesale the coordination rules found in Part 101 of the Commission's rules. SIA opposes this approach because the Part 101 rules do not apply to an analogous situation and would not allow FSS operators to protect earth station receivers from harmful interference.

Unlike traditional fixed services, where all emitters are individually licensed and operate at known, fixed locations and with known, unchanging bandwidths, the potential interference from new base station/mobile unit systems in the 3650-3700 MHz band cannot be predicted and therefore cannot be dealt with in a uniform way. Even though base station transmitters would be registered and fixed, such base stations transmit to and receive transmissions from an ever-changing cloud of unregistered and unpredictable mobile units. Under such circumstances, it would be contrary to the public interest to impose coordination procedures developed for a different service with a distinct network architecture because such procedures would not adequately protect FSS earth station receive operations.

SIA believes that it may be appropriate to permit interested parties from the satellite and wireless industries to develop appropriate coordination procedures and

[24] WiMAX Forum Petition at 12.

[25] WCAI Petition at 22 and 23.

spectrum sharing criteria that account for the unique network architecture of terrestrial wireless services in the 3650-3700 MHz band and the protection requirements of FSS earth station receivers. The Commission has permitted industry to pursue such discussions with respect to sharing in the 5.9 GHz band between FSS and dedicated short-range communications ("DSRC") systems, which has led to a thorough technical examination of the spectrum sharing regime and progress toward an industry consensus regarding licensing and coordination regimes.[26] In the meantime, the Commission may rely on operator-to-operator coordination of terrestrial wireless operations within the 150 km protection zones around grandfathered extended C-band earth station sites to ensure that FSS receive operations are adequately protected.

[26] *See Amendment of the Commission's Rules Regarding Dedicated Short-Range Communication Services in the 5.850-5.925 GHz Band (5.9 GHz Band); Amendment of Parts 2 and 90 of the Commission's Rules to Allocate the 5.850-5.925 GHz Band to the Mobile Service for Dedicated Short Range Communications of Intelligent Transportation Services, Report and Order*, 19 FCC Rcd 2458, 2494 ¶¶ 79-80 (2004).

VI. CONCLUSION

For the reasons stated above, SIA urges the Commission to modify the *Order* on reconsideration in a manner consistent with SIA's Petition and this submission.

Respectively submitted,

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August 11, 2005

Appendix A

Protection Afforded to FSS Earth Stations

The actual protection FSS grandfathered earth stations will enjoy will depend on the number and location of fixed and base stations deployed outside of the exclusion zone and on the number, location, and activity factor of the mobile units deployed within the range of the fixed and base stations.

These parameters cannot be accurately defined, and moreover will vary from system to system, making the prediction of the protection afforded to FSS earth stations difficult to pinpoint.

Besides the uncertainty associated with these parameters, there are also no standardized procedures to be used in evaluating the level of interference expected from mobile units operating in the bands used by receiving FSS earth stations.

The provisions of Appendix 7 of the Radio Regulations, however, can be applied to determine the expected interference from fixed or base stations of the wireless service. For interference due to mobile units, given that it depends on the power levels of the units and their individual distances from the FSS earth stations, it is obvious that larger power levels with the resulting larger ranges (possible operation of mobile units closer to the FSS earth stations with the resulting reduced path loss to attenuate the interference) will have an additive effect towards increasing the potential for interference into the FSS earth stations.

Assuming that the allowance for interference into digital carriers received by FSS earth stations as per Appendix 7 is equally split between fixed/base stations and mobile units to cover the case of co-frequency operations, a rough order of magnitude of the impact on the FSS earth station can be established in terms of margins over this criterion for the interference caused by the base station located at 150 km from the FSS earth station.

In order to determine the path loss for the application of the Appendix 7 procedures, the propagation loss derived for 150 km according to the 1995 implementation of ITU Rec. P.452 available at the ITU website was used, assuming smooth earth and 10 dB additional losses caused by potential obstacles, and for 0.0017% of the time as per Appendix 7. The results of the application of this model are provided in Table 1.

Table 1

Margin Over Assumed Protection Criterion Provided by 150 km Separation[1]

FSS ES main beam angle towards the unlicensed device (°)	5	15	48
FSS ES antenna gain towards the unlicensed device (dBi) [3]	14.5	2.6	-10.0
Total system noise temperature (K)	142.8	142.8	142.8
Thermal noise power (dBW/MHz)	-147.1	-147.1	-147.1
Allowable interference level per Appendix 7 of the RR [4] (dBW/MHz)	-152.4	-152.4	-152.4
Allowable interference at FSS ES antenna (dBW/MHz)	-166.9	-155.0	-142.4
EIRP density of fixed unit (dBW/MHz)	0	0	0
Required attenuation (dB)	-166.9	-155.0	-142.4
Margin (dB) provided by 150km separation using 1995 Rec. P.452 for p=0.0017% (153.4 dB)	-13.5	-1.6	11.0

Table 1 demonstrates that not all situations of off-axis angle towards the interfering base station, measured from the main beam of the FSS earth station, are covered by the adopted combination of separation distance and power limit. Consequently, any increase in the permitted power of base stations without a corresponding increase in the exclusion zone will only worsen the interference situation.

[1] Assumes one fixed station operating at 25W/25MHz.

CERTIFICATE OF SERVICE

I, David Cavossa, hereby certify that on this eleventh day of August, 2005, I caused a copy of the foregoing Opposition and Comments to be filed with the Secretary via ECFS and served via first-class mail upon the following:

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